

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

MITSUBISHI RF POWER MOS FET

RD16HHF1

RoHS Compliance, Silicon MOSFET Power Transistor 30MHz,16W

DESCRIPTION

RD16HHF1 is a MOS FET type transistor specifically designed for HF RF power amplifiers applications.

FEATURES

High power gain:

$P_{out} > 16W$, $G_p > 16dB$ @ $V_{dd} = 12.5V$, $f = 30MHz$

APPLICATION

For output stage of high power amplifiers in HF band mobile radio sets.

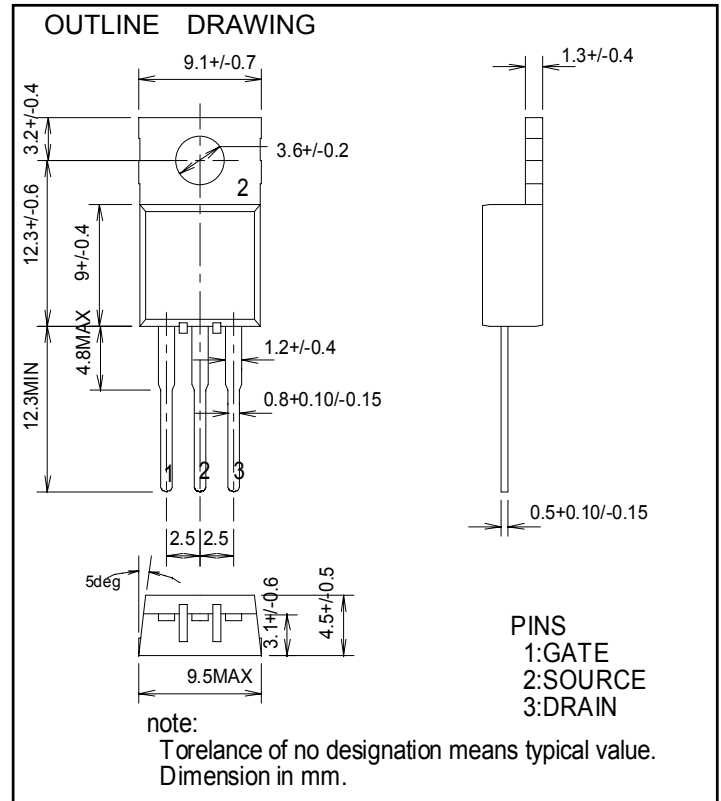
RoHS COMPLIANT

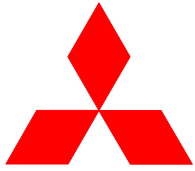
RD16HHF1-101 is a RoHS compliant products.
RoHS compliance is indicate by the letter "G" after the lot marking.

This product include the lead in high melting temperature type solders.

How ever,it applicable to the following exceptions of RoHS Directions.

- 1.Lead in high melting temperature type solders(i.e.tin-lead solder alloys containing more than85% lead.)





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ABSOLUTE MAXIMUM RATINGS

(T_c=25°C UNLESS OTHERWISE NOTED)

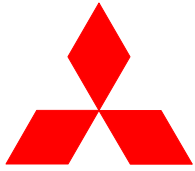
SYMBOL	PARAMETER	CONDITIONS	RATINGS	UNIT
V _{DSS}	Drain to source voltage	V _{GS} =0V	50	V
V _{GSS}	Gate to source voltage	V _{DS} =0V	+/- 20	V
P _{ch}	Channel dissipation	T _c =25°C	56.8	W
P _{in}	Input power	Z _g =Z _l =50Ω	0.8	W
I _D	Drain to source current	-	5	A
T _{ch}	Channel temperature	-	150	°C
T _{stg}	Storage temperature	-	-40 to +150	°C
R _{th j-c}	Thermal resistance	junction to case	2.2	°C/W

Note 1: Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS (T_c=25°C , UNLESS OTHERWISE NOTED)

SYMBOL	PARAMETER	CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX.	
I _{DSS}	Zero gate voltage drain current	V _{DS} =17V, V _{GS} =0V	-	-	10	uA
I _{GSS}	Gate to source leak current	V _{GS} =10V, V _{DS} =0V	-	-	1	uA
V _{TH}	Gate threshold voltage	V _{DS} =12V, I _{DS} =1mA	1.7	-	4.7	V
P _{out}	Output power	V _{DD} =12.5V, P _{in} =0.4W,	16	19	-	W
η _D	Drain efficiency	f=30MHz, I _{dq} =0.5A	55	65	-	%
	Load VSWR tolerance	V _{DD} =15.2V, P _o =16W(Pin Control) f=30MHz, I _{dq} =0.5A, Z _g =50Ω Load VSWR=20:1(All Phase)	No destroy			-

Note : Above parameters , ratings , limits and conditions are subject to change.



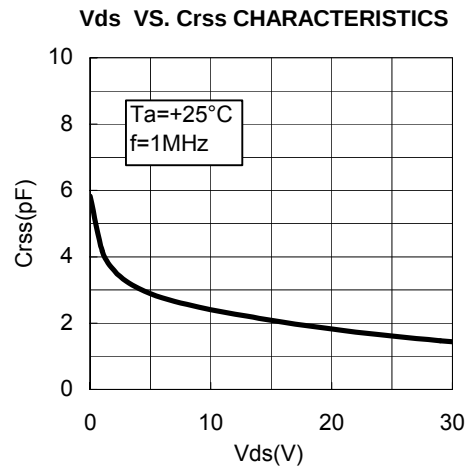
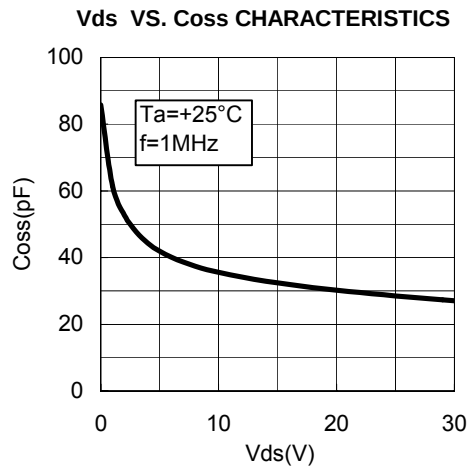
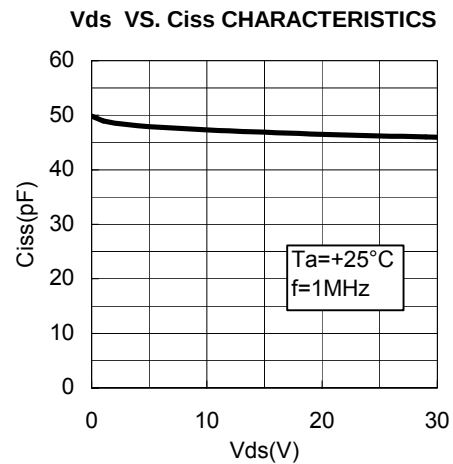
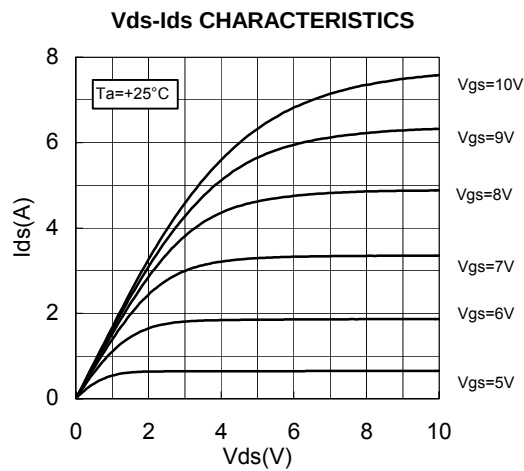
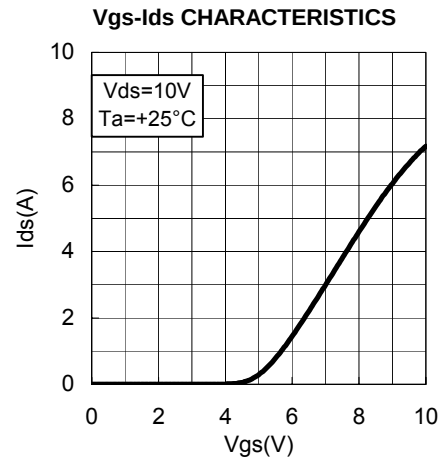
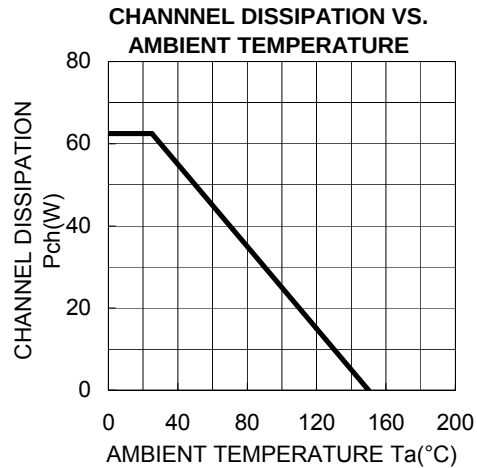
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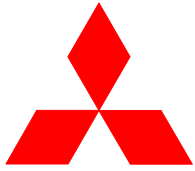
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TYPICAL CHARACTERISTICS





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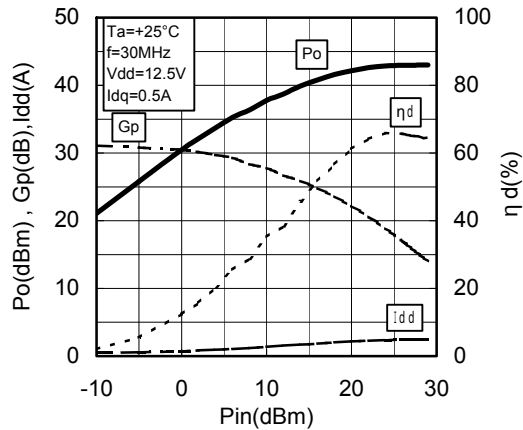
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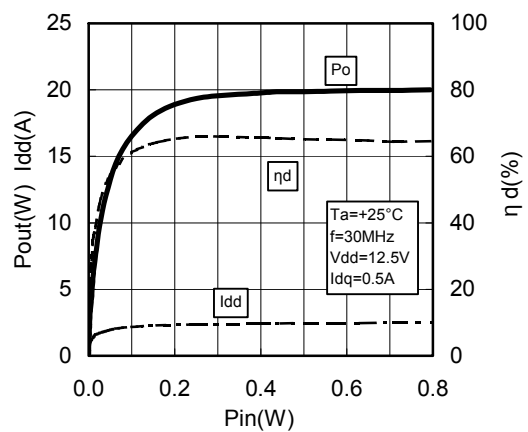
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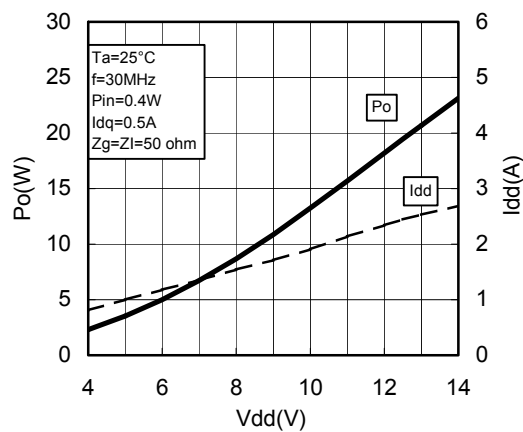
Pin-Po CHARACTERISTICS



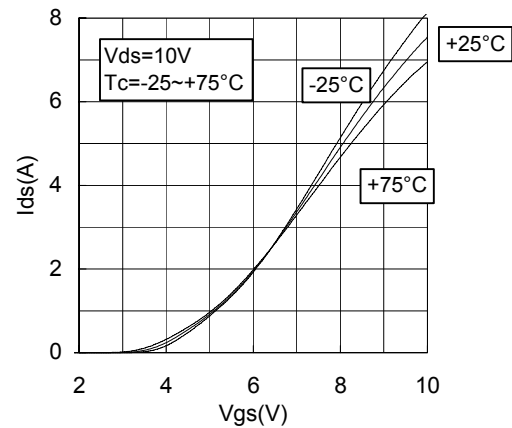
Pin-Po CHARACTERISTICS

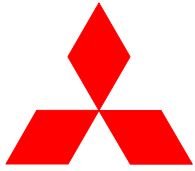


Vdd-Po CHARACTERISTICS



Vgs-IdS CHARACTERISTICS 2





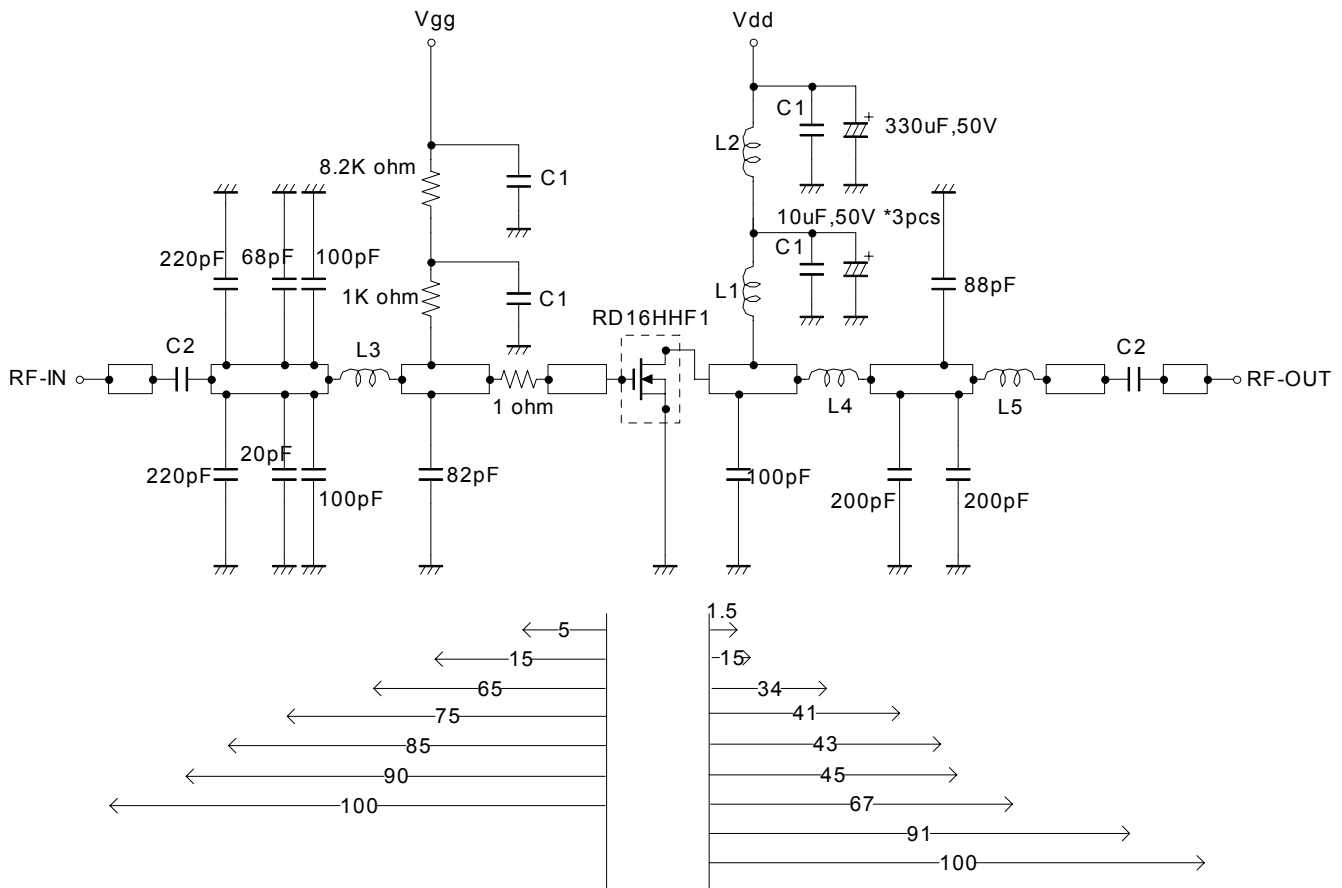
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TEST CIRCUIT(f=30MHz)



C1:100pF,0.022uF,0.1uF in parallel

C2:470pF*2 in parallel

L1:10Turns,I.D8mm,D0.9mm copper wire

L2:10Turns,I.D6mm,D1.6mm silver plated copper wire

L3:9Turns,I.D5.6mm,D0.9mm copper wire

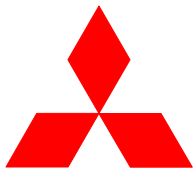
L4:4Turns,I.D5.6mm,D0.9mm,P=0.5mm copper wire

L5:5Turns,I.D5.6mm,D0.9mm,P=1mm copper wire

Dimensions:mm

Note:Board material-teflon substrate

micro strip line width=4.2mm/50 ohm,er:2.7,t=1.6mm



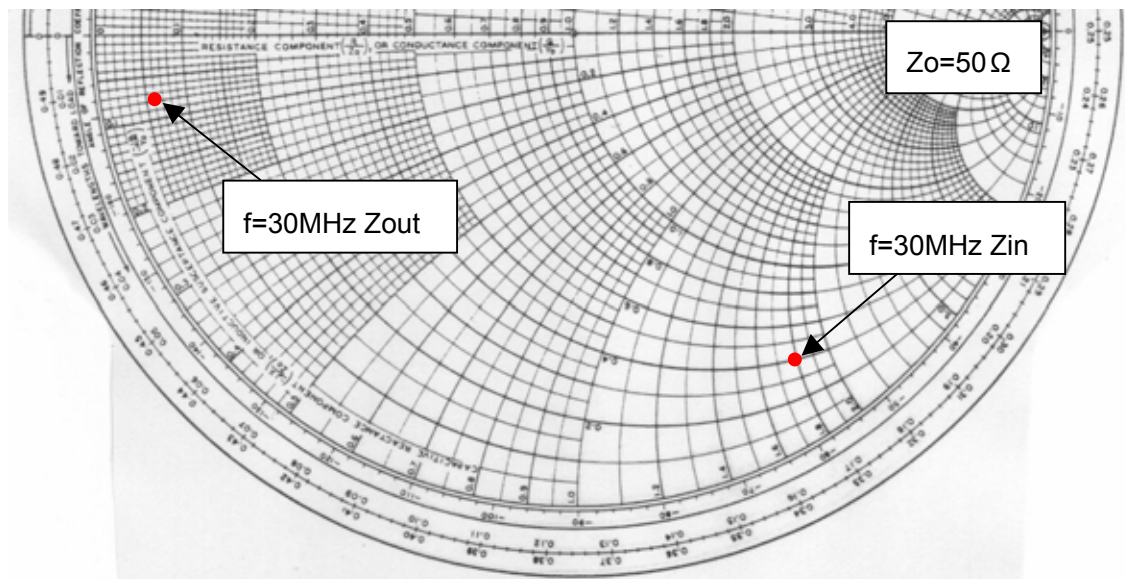
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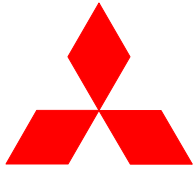
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INPUT/OUTPUT IMPEDANCE VS.FREQUENCY CHARACTERISTICS



Zin , Zout

f	Zin	Zout	Conditions
(MHz)	(ohm)	(ohm)	
30	20.02-j89.42	2.99-j3.66	Po=20W, Vdd=12.5V, Pin=0.4W



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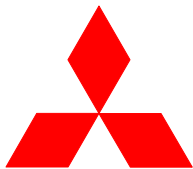
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RD16HHF1 S-PARAMETER DATA (@Vdd=12.5V, Id=800mA)

Freq. [MHz]	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
10	0.928	-43.2	50.035	150.2	0.013	60.6	0.705	-44.6
30	0.761	-96.8	32.680	117.1	0.025	34.3	0.588	-92.6
50	0.676	-121.9	22.018	101.3	0.027	24.3	0.540	-116.9
100	0.650	-145.8	11.543	81.0	0.025	20.3	0.543	-138.4
150	0.679	-156.4	7.560	66.2	0.023	27.0	0.586	-147.1
200	0.709	-162.7	5.380	55.7	0.022	46.4	0.633	-153.2
250	0.742	-168.0	4.126	45.9	0.026	63.2	0.698	-158.1
300	0.775	-173.0	3.208	36.9	0.034	74.4	0.727	-163.2
350	0.801	-177.7	2.592	29.6	0.045	78.3	0.769	-168.0
400	0.826	-177.7	2.133	22.6	0.056	78.4	0.805	-172.8
450	0.844	-173.2	1.775	16.6	0.069	78.1	0.822	-176.8
500	0.861	-169.0	1.509	11.3	0.081	75.3	0.851	-178.9
550	0.874	-164.8	1.283	5.9	0.093	73.1	0.867	-174.7
600	0.884	-160.7	1.114	2.1	0.104	69.8	0.877	-170.9
650	0.892	-156.9	0.974	-1.9	0.117	67.2	0.894	-166.9
700	0.900	-153.0	0.855	-5.3	0.129	63.7	0.897	-163.4
750	0.903	-149.1	0.759	-8.4	0.140	60.6	0.904	-159.6
800	0.908	-145.5	0.678	-11.3	0.150	56.8	0.914	-155.9
850	0.912	-141.7	0.614	-13.5	0.161	53.8	0.915	-152.9
900	0.912	-137.9	0.559	-15.3	0.172	50.4	0.917	-149.0
950	0.913	-134.3	0.509	-17.3	0.180	47.1	0.922	-145.4
1000	0.913	-130.7	0.467	-17.9	0.190	43.6	0.920	-142.4



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—————Keep safety first in your circuit designs! —————

Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

————— **warning !** —————

Do not use the device at the exceeded the maximum rating condition. In case of plastic molded devices, the exceeded maximum rating condition may cause blowout, smoldering or catch fire of the molding resin due to extreme short current flow between the drain and the source of the device. These results causes in fire or injury.